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EXAMINER	
HERNANDEZ, NELSON D	

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2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/530,085	TSURUOKA, TAKAO
	Examiner	Art Unit
	Nelson D. Hernández Hernández	2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 November 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,17,18 and 22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,6,17 and 18* is/are rejected.

7)☒ Claim(s) *2,3,5,7 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2008* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on December 31, 2008. These drawings are acceptable.

Response to Amendment

2. The Examiner acknowledges the amended claims filed on November 24, 2008. **Claims 1-3, 17 and 18** have been amended. **Claims 8-16 and 19-21** have been cancelled. **Claim 22** have been newly added.

Response to Arguments

3. Applicant's arguments with respect to **claims 1 and 17** have been considered but are moot in view of the new grounds of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Til et al., WO 97/23993 A in view of Jacobs, US Patent 7,102,672 B1.

6. **Regarding claim 1, Til et al.** discloses an image pickup system (*See fig. 2*) comprising:

a block extracting unit (*performed by block generator 2 as shown in fig. 1*) for extracting a block area with a predetermined size from a signal of an image pickup device (*Page 11, lines 1-6*);

a transforming unit (*Fig. 1: 3*) for transforming the signal in the block area extracted by the block extracting means unit into a signal in a frequency space (*Page 11, lines 13-24*);

a noise estimator (*Fig. 1: 4*) for estimating an amount of noise of a frequency component except for a zero-order component based on a zero-order component in the signal in the frequency space transformed by the transforming unit (*Page 11, line 24 – page 12, line 25*);

a noise reducing unit (*Fig. 1: 5*) for reducing noise of the frequency component except for the zero-order component based on the amount of noise estimated by the noise estimator (*Page 11, lines 16-20; page 13, lines 3-26*); and

a compressing unit (*Fig. 1: 6*) for compressing the zero-order component and the frequency component except for the zero-order component from which the noise is reduced (*Page 13, lines 3-26*) (*See also page 13, line 27 – page 14, line 30 for image pickup system details*).

The Examiner noted that the limitations "*a noise estimator for estimating an amount of noise of <u>a frequency component except for a zero-order component based on</u>*

a zero-order component in the signal in the frequency space transformed by the transforming unit as well as the temperature and signal gain provided by the obtaining unit" of claim 1 as written do not require that the estimated noise is obtained based on a combination of the zero-order component in the signal in the frequency space transformed signal, the temperature and the signal gain. The claim as written can be read as estimating an amount of noise based on the zero-order component in the signal in the frequency space transformed signal, estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit.

Although Til et al. discloses estimating an amount of noise of a frequency component except for a zero-order component based on a zero-order component in the signal in the frequency space transformed by the transforming unit, Til et al. does not explicitly disclose an obtaining unit for obtaining a temperature of the image pickup device and a gain of the signal; and estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit.

However, **Jacobs** teaches the concept correcting dark noise from image signal generated at the image array by monitoring the temperature of the image array using temperature monitors (*Jacobs discloses monitoring the temperature of the image array, wherein said temperature contributes to dark noise generated that would affect the image signal. See col. 4, lines 5-57; col. 4, line 60 – col. 5, line 29. This teaches an obtaining unit for obtaining a temperature of the image pickup device*) and obtaining the

gain of the image signal (*Jacobs discloses determining the gain of the image signal (G_1*) that would contribute to dark noise in the image signal. See col. 5, lines 36-55. This teaches an obtaining unit for obtaining a gain of the signal*), wherein said monitored temperature and said obtained signal gain are used to estimate and correct dark current noises generated in the image array (*See col. 4, line 5 - col. 5, line 55. This teaches estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit.*).

Therefore, after acknowledging the concept of obtaining the temperature of the image array and the signal gain of the image signal to estimate the noises in the image signal to correct said image signal as taught in Jacobs, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to modify the teaching of Til et al. to have an obtaining unit for obtaining a temperature of the image pickup device and a gain of the signal; and to have said noise estimator further estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit. The motivation to do so would have been to allow subtraction of noise related to dark current as suggested by Jacobs (*Col. 2, lines 18-34*).

7. **Regarding claim 17**, Til et al. discloses a method for reducing noise in an image produced by an image pickup system (*See fig. 2*) having an image pickup device (*Page 11, lines 1-6*) configured to convert optical image into a signal, comprising the steps of:

a) extracting a block area of a predetermined size from a signal provided by an image pickup device (*performed by block generator 2 as shown in fig. 1; page 11, lines 1-6*);

b) transforming the signal in the block area extracted in step (a) into a signal in a frequency space (*performed by transformer unit 3 as shown in fig. 1; page 11, lines 13-24*);

e) estimating an amount of noise in a frequency component except for a zero-order component based on the zero-order component in the signal in the frequency space transformed at step (b) (*performed by noise estimator 4 as shown in fig. 1; page 11, line 24 – page 12, line 25*);

f) reducing noise in the frequency component except for the zero-order component based on the amount of noise estimated at step (c) (*performed by noise attenuator 5 as shown in fig. 1; page 11, lines 16-20; page 13, lines 3-26*); and

g) compressing the zero-order component and the frequency component except for the zero-order component from which the noise is reduced (*performed by synthesizing unit 6 as shown in fig. 1; page 13, lines 3-26*) (*See also page 13, line 27 – page 14, line 30 for image pickup system details*), to thereby obtain a high quality image (*The Examiner noted the recitation "<u>to thereby obtain a high quality image</u>" in the limitations. It is noted by the Examiner that the recitation "<u>to thereby obtain a high quality image</u>" is non-limiting and therefore has not been given patentable weight during examination of the claims on their merits. Language that suggests or makes optional*

but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation. MPEP §2106.

The subject matter of a properly construed claim is defined by the terms that limit its scope. It is this subject matter that must be examined. As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. <u>Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation</u>. The following are examples of language that may raise a question as to the limiting effect of the language in a claim:

(A) <u>statements of intended use or field of use</u>,

(B) "adapted to" or "adapted for" clauses,

(C) "wherein" clauses, or

(D) "whereby" clauses.

This list of examples is not intended to be exhaustive. See also MPEP § 2111.04.

USPTO personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim should not be read into the claim. E-Pass Techs., Inc. v. 3Com Corp., 343 F.3d 1364, 1369, 67 USPQ2d 1947, 1950 (Fed. Cir. 2003) (<u>claims must be interpreted "in view of the specification" without importing limitations from the specification into the claims unnecessarily</u>). In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550- 551

(CCPA 1969). See also In re Zletz, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow.... The reason is simply that during patent prosecution when claims can be amended, ambiguities should be recognized, scope and breadth of language explored, and clarification imposed.... An essential purpose of patent examination is to fashion claims that are precise, clear, correct, and unambiguous. Only in this way can uncertainties of claim scope be removed, as much as possible, during the administrative process."). Furthermore, Til et al. discloses that the noise correction is intended to improve the image quality of the image (Page 14, lines 19-25).

The Examiner noted that the limitations "*a noise estimator for estimating an amount of noise of a frequency component except for a zero-order component based on a zero-order component in the signal in the frequency space transformed by the transforming unit as well as the temperature and signal gain provided by the obtaining unit*" of claim 17 as written do not require that the estimated noise is obtained based on a combination of the zero-order component in the signal in the frequency space transformed signal, the temperature and the signal gain. The claim as written can be read as estimating an amount of noise based on the zero-order component in the signal in the frequency space transformed signal, estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit.

Although Til et al. discloses estimating an amount of noise in a frequency component except for a zero-order component based on the zero-order component in the signal in the frequency space transformed at step (b), Til et al. does not explicitly disclose c) obtaining a temperature of the image pickup device; d) obtaining a gain of the signal; further estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain.

However, **Jacobs** teaches the concept correcting dark noise from image signal generated at the image array by monitoring the temperature of the image array using temperature monitors (*Jacobs discloses monitoring the temperature of the image array, wherein said temperature contributes to dark noise generated that would affect the image signal. See col. 4, lines 5-57; col. 4, line 60 – col. 5, line 29. This teaches obtaining a temperature of the image pickup device*) and obtaining the gain of the image signal (*Jacobs discloses determining the gain of the image signal (G_1*) that would contribute to dark noise in the image signal. See col. 5, lines 36-55. This teaches obtaining a gain of the signal*), wherein said monitored temperature and said obtained signal gain are used to estimate and correct dark current noises generated in the image array (*See col. 4, line 5 - col. 5, line 55. This teaches estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit.*).

Therefore, after acknowledging the concept of obtaining the temperature of the image array and the signal gain of the image signal to estimate the noises in the image signal to correct said image signal as taught in Jacobs, it would have been obvious to

one of an ordinary skill in the art at the time the invention was made to modify the teaching of Til et al. to include the steps of obtaining a temperature of the image pickup device and a gain of the signal; and further estimating an amount of noise based on the temperature and estimating an amount of noise based on the signal gain provided by the obtaining unit. The motivation to do so would have been to allow subtraction of noise related to dark current as suggested by Jacobs (*Col. 2, lines 18-34*).

8. Claims 4, 6 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Til et al., WO 97/23993 A in view of Jacobs, US Patent 7,102,672 B1 and further in view of Yonekawa et al., US Patent 5,046,121.

Regarding claim 4, Although Til et al. discloses correcting the frequency component except for the zero component based on an upper limit value and an lower limit value set by the noise estimator (*page 12, lines 3-25*) based on the DC component which is used to set the statistical variances to determine said upper and lower limits, the combined teaching of Til et al. in view of Jacobs fails to teach an average calculating unit for calculating an average of the frequency component except for the zero-order component; an allowable range setting unit for setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated by the average calculating unit and the amount of noise estimated by the noise estimator; and a correcting unit for correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set by the allowable range setting unit.

However, **Yonekawa** discloses an image data compression apparatus (*See fig. 1*), comprising a DCT device (*Fig. 1: 20*) for transforming the image signal into frequency space, wherein an average of the amplitude of the AC components is calculated to determine an upper and lower limit value of the frequency component except for the zero order component (*DC component*), wherein said upper limit and lower limit are used as reference for correcting the frequency components based on the range so that the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, can be suppressed to compress the image data while retaining a higher image quality (*Col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45*).

Therefore, taking the combined teaching of Til et al. in view of Jacobs and further in view of Yonekawa as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to apply the concept of averaging the AC components to create an upper and lower limit to adjust the AC components based on said upper and lower limits as taught in Yonekawa to modify the teaching of Til et al. and Jacobs to have an average calculating unit for calculating an average of the frequency component except for the zero-order component; an allowable range setting unit for setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated by the average calculating unit and the amount of noise estimated by the noise estimator; and a correcting unit for correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set by the allowable range setting unit. The motivation to do so would have been to allow proper correction

of the dynamic range of the image and to have the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, be suppressed to compress the image data while retaining a higher image quality.

9. **Regarding claim 6**, the combined teaching of Til et al. in view of Jacobs and further in view of Yonekawa as discussed and analyzed in claim 4 further teaches that the noise reducing means unit further comprises: a threshold setting unit for setting an amplitude value of the noise of the frequency component except for the zero-order component as a threshold value based on the amount of noise estimated by the noise estimating unit (*see Yonekawa as discussed with respect to claim 4, col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45*); and a smoothing unit for reducing an amplitude component which is below the threshold set by the threshold setting unit with respect to the frequency component except for the zero-order component (*Yonekawa teaches adjusting the amplitude values of the AC component as a result of a comparison between the AC component and the threshold (R); col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45*).

10. **Regarding claim 18**, although Til et al. discloses correcting the frequency component except for the zero component based on an upper limit value and an lower limit value set by the noise estimator (*page 12, lines 3-25*) based on the DC component which is used to set the statistical variances to determine said upper and lower limits, the combined teaching of Til et al. in view of Jacobs fails to teach that the step (d)

further comprises: (f) calculating an average of the frequency component except for the zero-order component; (g) setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated at step (f) and the amount of noise estimated by at step (c); and h) correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set at step (g).

However, **Yonekawa** discloses an image data compression apparatus (*See fig. 1*), comprising a DCT device (*Fig. 1: 20*) for transforming the image signal into frequency space, wherein an average of the amplitude of the AC components is calculated to determine an upper and lower limit value of the frequency component except for the zero order component (*DC component*), wherein said upper limit and lower limit are used as reference for correcting the frequency components based on the range so that the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, can be suppressed to compress the image data while retaining a higher image quality (*Col. 6, line 47 – col. 8, line 53; col. 12, lines 35-45*).

Therefore, taking the combined teaching of Til et al. in view of Jacobs and further in view of Yonekawa as a whole, it would have been obvious to one of an ordinary skill in the art at the time the invention was made to apply the concept of averaging the AC components to create an upper and lower limit to adjust the AC components based on said upper and lower limits as taught in Yonekawa to modify the teaching of Til et al. and Jacobs to have an average calculating unit for calculating an average of the frequency component except for the zero-order component; an allowable range setting

unit for setting an upper limit value and a lower limit value of the frequency component except for the zero-order component based on the average calculated by the average calculating unit and the amount of noise estimated by the noise estimator; and a correcting unit for correcting the frequency component except for the zero-order component based on the upper limit value and the lower limit value set by the allowable range setting unit. The motivation to do so would have been to allow proper correction of the dynamic range of the image and to have the block boundary artifacts which might otherwise occur due to the improper cutoff frequency, be suppressed to compress the image data while retaining a higher image quality.

Allowable Subject Matter

11. **Claims 2, 3, 5, 7 and 22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

13. **Regarding claim 5**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, a frequency separating unit for separating the frequency component except for the zero-order component of predetermined frequency bands; and a selecting unit for selecting whether or not noise

is reduced from the frequency band separated by the frequency separating unit, including all the limitations of claims 1 and 4.

14. **Regarding claim 7**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, a frequency separating unit for separating the frequency component except for the zero-order component of predetermined frequency bands; and a selecting unit for selecting whether or not noise is reduced from the frequency band separated by the frequency separating unit, including all the limitations of claims 1 and 6.

15. **Regarding claim 22**, the main reason for indication of allowable subject matter is because the prior art fails to teach or reasonably suggest, a giving unit for providing standard values of the temperature of the image pickup device and the gain of the signal, wherein, if the obtaining unit does not provide a temperature and a signal gain, the noise estimator estimates the amount of noise by using a temperature and a signal gain provided as standard values by said giving unit, including all the limitations of claim 1.

Conclusion

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nelson D. Hernández Hernández whose telephone number is (571) 272-7311. The examiner can normally be reached on 9:00 A.M. to 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lin Ye/
Supervisory Patent Examiner, Art Unit 2622

NDHH
April 6, 2009